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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,829	10/07/2003	Aaftab A. Munshi	022193-060410US	6592

20350 7590 11/02/2005

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EXAMINER

NGUYEN, KIMBINH T

ART UNIT PAPER NUMBER

2671

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/681,829	Applicant(s) MUNSHI ET AL.	
	Examiner Kimbinh T. Nguyen	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

By

DETAILED ACTION

1. Claims 1-45 are pending in the application.

Drawings

2. Figures 1A, 1B and 1C should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 9, 10 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gossweiler, III et al. (6,400,372) in view of Kichury, Jr. (5,831,620).

Claim 1, Gossweiler, III et al. discloses rendering a scene (scene 400; fig. 4) including an object having more than one representation (object J 401 having LOD (J1)

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404, LOD (J2) 405 and LOD (J3) 406; see fig. 4), each representation having a corresponding level of detail (fig. 4), Gossweiler, III does not teach a rendering system that computes a first point of intersection between an appropriate one of the representations of the object and a ray corresponding to a view of the scene, and a second point of intersection between an alternate one of the representations of the object; however, Kichury, Jr. teaches computing intersection points (col. 1, lines 15-30;) and a further projection of the ray (fig. 9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ray tracing taught by Kichury, Jr. into the method for selecting LODs for objects having multi-resolution of Gossweiler, III for computing intersection points, because it would create real-time mirror reflections in a computer-generated scene (col. 1, lines 9-10).

Claims 2 and 3, Gossweiler, III discloses determines first and second colors respectively associated with the first and second points of intersection; blends the first and second colors to provide a combined color for a pixel corresponding to the ray (figs. 13 and 15).

Claim 4, Gossweiler, III discloses the rendering system blends the first and second colors in accordance with first and second weights respectively associated with the appropriate and alternate representations (col. 4, lines 27-46).

Claim 5, Gossweiler, III discloses the rendering system selects the appropriate and alternate representations from among the more than one representation (col. 10, lines 20-21).

Claim 6, Gossweiler, III discloses the rendering system selects the representations in accordance with a perceived size of the object in the scene (the hit values; col. 7, lines 34-44).

Claim 7, the rationale provided in the rejection of claim 1 is incorporated herein. In addition, Jenkins discloses a scene server for identifying an appropriate representation of an object among more than one representation of the object (client server; col. 22, lines 38-44), each representation having a corresponding level of detail (col. 22, lines 45-61); and a ray tracer (ray casting processor; fig. 22). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the client server and ray casting processor taught by Jenkins into the method for selecting LODs for objects having multi-resolution of Gossweiler, III for rendering a scene of an object, because using scene server to supply material and texture data for shading samples generated by ray casting, it would allow interactive manipulation of parameters such as lighting, material, and texture editing during the real-time rendering (col. 47, lines 32-34).

Claim 9, Gossweiler, III discloses weights are respectively associated with the appropriate and alternate representations (col. 10, lines 45-65).

Claim 10, Gossweiler, III teaches weights are respectively associated with the appropriate and alternate representations (the hit values; col. 14, lines 10-29); the shader further determining a final color based on the respective colors and the respective weights (col. 19, lines 36-38).

Claim 45, Kichury, Jr. discloses determining a respective color associated with the first and second points of intersection and the respective weights (col. 1, lines 20-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a pixel color taught by Kichury, Jr. into the method for selecting LODs for objects having multi-resolution of Gossweiler, III for computing intersection points, because it would increase image quality (col. 1, line 31).

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gossweiler, III et al. (6,400,372) in view of Kichury, Jr. (5,831,620) and further in view of Ouaknine et al. (6,091,422).

Claim 8, Ouaknine et al. discloses a shader that determines a respective color associated with the first and second points of intersection (col. 4, lines 15-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a shader taught by Ouaknine into the method for selecting LODs for objects having multi-resolution of Gossweiler, III for generating eye rays, because it would provide full access to the editing tools normally associated with the editing environment (col. 4, lines 26-27).

6. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gossweiler, III et al. (6,400,372) in view of Kichury, Jr. (5,831,620) and further in view of Lathrop (6,597,359).

Claims 11, 12, Lathrop discloses the ray tracer generates a ray tree based on the first point of intersection and a sibling ray tree based on the second point of intersection (fig. 3); determining a respective color associated with the first and second

points of intersection and the respective weights (fig. 3: evaluate color at intersection point). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a generating eye rays taught by Lathrop into the method for selecting LODs for objects having multi-resolution of Gossweiler, III for generating eye rays, because it would provide high quality of the resulting images, which can include shadows, reflections, and refractive effect (col. 1, lines 16-18).

7. Claims 13-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gossweiler, III et al. (6,400,372) in view of Kichury, Jr. (5,831,620) and further in view of Kaufman et al. US 2004/0125103.

Claims 13-18, Kaufman et al. discloses the ray is a camera ray (paragraph 0418); the ray is a shadow ray (paragraphs 0439, 0548); the ray is one of a refracted ray and a reflected ray (reflected ray 548, paragraph 0439). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a camera ray, a shadow ray and a reflected ray taught by Kaufman into the method for selecting LODs for objects having multi-resolution of Gossweiler, III for rendering a scene of an object, because it would provide flexible, high quality, true real-time volume rendering from arbitrary viewing directions, control of rendering and projection parameters, and mechanisms for visualizing internal and surface structures of high resolution datasets (paragraph 0018).

Claims 19-42, the rationale provided in the rejection of claims 1, 2, 4 and 10-18 are incorporated herein.

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8. Claims 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gossweiler, III et al. (6,400,372) in view of Kichury, Jr. (5,831,620) and further in view of "Chapter 10", Procedural Models and Level of Detail, pages 193-200.

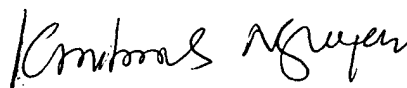
Claims 43 and 44, "Chapter 10" discloses determining a perceived size of the object (apparent size of an object); comparing the perceived size with a value corresponding to the perceived size respectively associated with each representation and identifying the appropriate and alternate representations in accordance with a result of the comparing; respectively associating weights with the appropriate and alternate representation in accordance with the result of the comparing (pages 195-200). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate determining apparent size value taught by "Chapter 10" into the method for selecting LODs for objects having multi-resolution of Gossweiler, III for rendering a scene of an object, because it would allow a set of alternatives to be specified then chooses the appropriate one based on its apparent size in the image for providing the right level of visual interest at reasonable cost (see section "Level of Detail Calculations and Models", page 194).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimbinh T. Nguyen whose telephone number is (571) 272-7644. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Friday from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached at (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

October 27, 2005



KIMBINH T. NGUYEN
PRIMARY EXAMINER